

Mint of the United States at Philadelphia,

MELTING AND REFINING DEPARTMENT,

Philadelphia, 30th Sept. —, 1885.

Sir

I have experimented on the Black Lead crucibles to determine their infusibility and unalterability, when exposed to the highest heat demanded by the operations of the U. S. Mint, with the following results.

We melt Gold, Silver, Copper, and the 5-cent alloy, the three former requiring a full red heat, and the 5 cent alloy a white heat for melting.

To make an alloy of two metals I find it necessary to employ a little higher heat than for melting the alloy, when once made. In making the 5 cent alloy of nickel and copper, complete alloyage is only effected with certainty by maintaining the crucible at a full white heat for some time, say an hour or two. Since we sometimes have to make the nickel alloy for the 5 cent piece, it is essential to have black lead

crucibles that will withstand a full white heat without melting, and since such crucibles will better endure the more moderate, but still high heat, required for melting gold and silver alloys, I employ such crucibles altogether for melting in the Mint, as most effective and economical. They must resist a full white heat for some time after repeated meltings, to be adapted to Mint work.

The following are the results of my experimental meltings with the crucibles submitted by five different firms or persons, — by Newkumet, Seidel and Taylor of Philadelphia, — by the J. Dixon Co. of Jersey City, — and from Taunton, Massachusetts.

Each crucible was used for two days, making two melts in it each day (or 4 melts altogether) except where it began to yield by softening or melting. The effect of the fire is best and soonest observed on the outside of the crucible, between 2 and 4 inches from the bottom, which is the zone of highest heat.

The quantity of 5-cent alloy melted each time was about 150 lbs.

Newkumet. One crucible stood nearly three melts, then melted a hole in the side out of which nearly all the metal flowed. The other crucible began to melt in the zone of highest heat in the 4th melt.

Taunton, Mass. One pot showed a tendency to melt in the heat-zone, and was removed from the fire to prevent the metal flowing out in the 3rd melt. The other crucible withstood melting during 4 heats, except that it yielded at last in one place on the zone of highest heat.

Dixon. The two pots stood 4 heat tolerably well, slightly melting and flowing around the zone of highest heat; and one of them melting out rather deeply at one point.

Seidel. Both crucibles began to soften a little in the 4th melt, and showed only the slightest tendency to melt in the zone of the highest heat, except

in one spot, where it flowed a little.

Taylor. Neither of these two pots showed the slightest tendency to melt or even to soften, and at the close of the experiments with the 2nd pot on the 2nd day, it was heated up to a point of intense whiteness, and maintained at that for more ~~than~~ ^{out} an hour with ~~the~~ ^{out} slightest tendency, even to soften.

It is clear from the above statement that the Black Lead crucibles of Taylor are the most infusible and unalterable, and therefore best adapted to our use in the U. S. Mint at Philadelphia.

The crucibles of Seidel and Dixon are good, but not quite as resisting to heat as the preceding. They could not be used for the 5-cent alloy, altho' they might ^{be} for gold and silver alloys.

The crucibles from Taunton are rather inferior to the last (Dixon & Seidel). Those of New-komet are inferior to the last.

Very respectfully,
yr. Obedt Serv^t,
Jat C Booth
M & R

Hon. D. M. Fox,
Superintendent.

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MELTING AND REFINING DEPARTMENT,

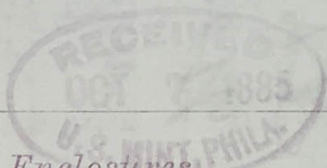
Sept 30, 1885.

Jas C. Booth

Melter and Refiner.

Test of Crucibles &
report thereon.

No. of Enclosures,



[Abstract:] Test of Crucibles & report there on.

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Melting and Refining Department,
Philadelphia,
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